hydrogen being supplied to the hydrodesulfurization zone other than the first zone; hydrogen-containing gas being recovered from a subsequent hydrodesulfurization zone; target sulfur levels, etc. The Examiner believes that Harrison teaches a process and composition that reasonably appears to be either the same or an obvious variation of the instantly claimed product and composition.

The Examiner also states that when an applicant contends that additional steps or materials in the prior art are excluded by the recitation of "consisting essentially of", the applicant has the burden of showing that the introduction of additional steps or components would materially change the characteristics of applicant's invention. The Examiner then states that there is no evidence that the recycle stream of Harrison would change the material characteristics of the claimed invention.

Further, the Examiner rejects applicants' previous argument with respect to the ratio of hydrogen to feed.

APPLICANTS' POSITION

It is applicants' position that one having ordinary skill in the art and knowledge of Harrison at the time the invention was made would not have found it obvious to arrive at the presently claimed invention.

The recycle stream of Harrison would materially alter the instant invention. As the volume of the recycle stream increases, so does the amount of sulfur exiting the first reaction zone. Table 3 of Harrison discloses the results of Comparative Example A and Examples 1-6 of Harrison. Line 222 in Table 3 an Figure 3 of Harrison correlates to the liquid product leaving the first hydrodesulfuirization ("HDS") reactor after leaving vessel 218. Vessel 218 is presumably a gas-liquid separation vessel because that is what vessel

"9" is referred to in Figure 1 of Harrison, and vessel 218 and 9 appear in the same place after reactor 1 of Harrison. See Fig. 3 of Harrison. Thus, the components of Line 222 listed in Table 3 of Harrison indicate the amount of that component in "ppm" after gas/liquid separation.

Line 247 in Table 3 correlates to the finished product exiting the Harrison process. See Fig. 3 of Harrison. By simply viewing the results contained in Table 3 of Harrison, one can clearly see that as the recycle stream volume increases, so does the amount of sulfur exiting the first stage, listed in col.4 of Table 3. Thus, it is also evident that the amount of sulfur entering the second HDS reaction zone also increases because Line 222 is the feed to the second HDS reaction zone of Harrison.

One can also calculate, as a percentage, the amount of sulfur form the original stream that is passed to the second HDS reaction zone of Harrison. Table 1 of Harrison includes the disclosure that the stream treated in the Harrison examples contains 22,300 wppm S (2.23wt%). By recycling 1 l/hr of liquid from the first hydrodesulfurization zone, the Harrison invention results in 3.2% of the original sulfur contained in the stream passing to the second hydrodesulfurization zone. Recycling 3 l/hr results in 5.3%, and recycling 7 l/hr results in 7.2% going to the second hydrodesulfurization zone.

The instant specification requires that the H_2S-rich gas be removed between the instant HDS reaction stages for the very reason that the desulfurization on the second stage is more efficient when the partial pressure of H_2S in the second reactor is reduced. In other words, the HDS performance of most HDS catalysts is sensitive to the amount of HDS made in the rector, which is a direct function of the amount of sulfur entering the reactor, whether it be H_2S or organic sulfur.

Simply put, the instant invention is directed at a process that achieves its primary benefit by reducing the H_2S produced in the second stage, and Harrison's invention calls for a recycle stream that clearly acts to the detriment of this benefit. As previously stated the HDS performance of most HDS catalysts is sensitive to the amount of H_2S made in the rector, which is a direct function of the amount of sulfur entering the reactor, whether it be H_2S or organic sulfur. The recycle steam of Harrison increases the amount of sulfur entering the second stage as evidenced by Table 3 of Harrison. Table 1 of the instant application lists the results of Examples 1-5 of the instant application. The amount of sulfur being passed to the second stage of the instant application is far less than that of Harrison.

The Examiner is requested to reconsider and withdraw this rejection.

Based on the preceding arguments, the Examiner is requested to reconsider and withdraw all rejections and pass this application to allowance. The Examiner is encouraged to contact applicants' attorney should the Examiner wish to discuss this application further.

Respectfully submitted:

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